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SESSION 5E: EARTH AND ENVIRONMENTAL SCIENCES — EXPLORATION

PAPER 5E-4

THE VIEW OF THE OCEAN FROM SPACE[1]

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Photographs taken during the orbital flights of Gemini spacecraft have been evaluated to determine their utility for oceanographic research. Of about 1500 color photographs taken, 575 contain images which are uniquely significant to oceanography. Some features of the ocean that were previously unknown have been seen, measured, and interpreted. The existence of others, only suspected from severely inadequate data, has been confirmed.

From the evaluation, we have learned the size, kind, and variations of features at the sea surface that respond in a narrow portion of the electromagnetic wave spectrum. Furthermore, it is now known that emissivity in invisible parts of the spectrum is wholly suitable for remote sensing of the ocean. Microwave, infrared, and ultraviolet sensors, in addition to those responsive to visible wave lengths, clearly have applications in oceanographic research from space.

The ocean and atmosphere are dynamic. Air and water are in constant motion and interaction. Processes and movements vary in size from molecular to global. Because interactions of these processes are so complex, it is clear that totally practical rationalizations will not result from "classical" investigations. Yet, practical applications must be developed, for the ocean and atmosphere are part of man's environment. The cost of not adequately understanding the processes of these environments is enormous--not only in money, but in the lives lost through inadequate prediction and protection.

It seems reasonable, then, that man's hope of satisfactorily understanding the air-sea processes, and reaping the practical benefits therefrom, lies in the overall view of the oceans and the overlying atmosphere which is now possible from spacecraft.

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1968. The view of the ocean from space. In 1968 IEEE International Convention digest; synopses of papers presented at the 1968 IEEE International Convention March 18-21, 1968, New York, N. Y., Paper 5E-4, p. 144. Institute of Electrical and Electronics Engineers, Inc., New York.